



## Science and Technology Parks A Review of their Performance and Regional Context-EUSPRI 2018

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*Publication date:*  
2018

*Document Version*  
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

*Citation (APA):*  
Poonjan, A., & Tanner, A. N. (2018). *Science and Technology Parks A Review of their Performance and Regional Context-EUSPRI 2018*. Poster session presented at EU-SPRI 2018 - Governance and relevance: Towards a new generation of research and innovation policies, Paris, France.

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# Science and Technology Parks: A Review of their Performance and Regional Context

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Preliminary finding for EU-SPRI 2018 Governance and Relevance: Towards a new generation of research and innovation policies presentation

## Background

The number of science and technology parks (STPs) have increased and continue to grow rapidly. However, the performance of STPs has always been questioned, and several empirical studies have demonstrated inconsistent results on STPs performance (e.g. Squicciarini, 2008, 2009; Yang, Motohashi, & Chen, 2009. Colombo & Delmastro, 2002; Lofsten & Lindelöf, 2002; Siegel et al., 2003; Westhead, 1997).

The unclear contribution of STPs has led to the question “what is the factor that influences the performance of STPs?”

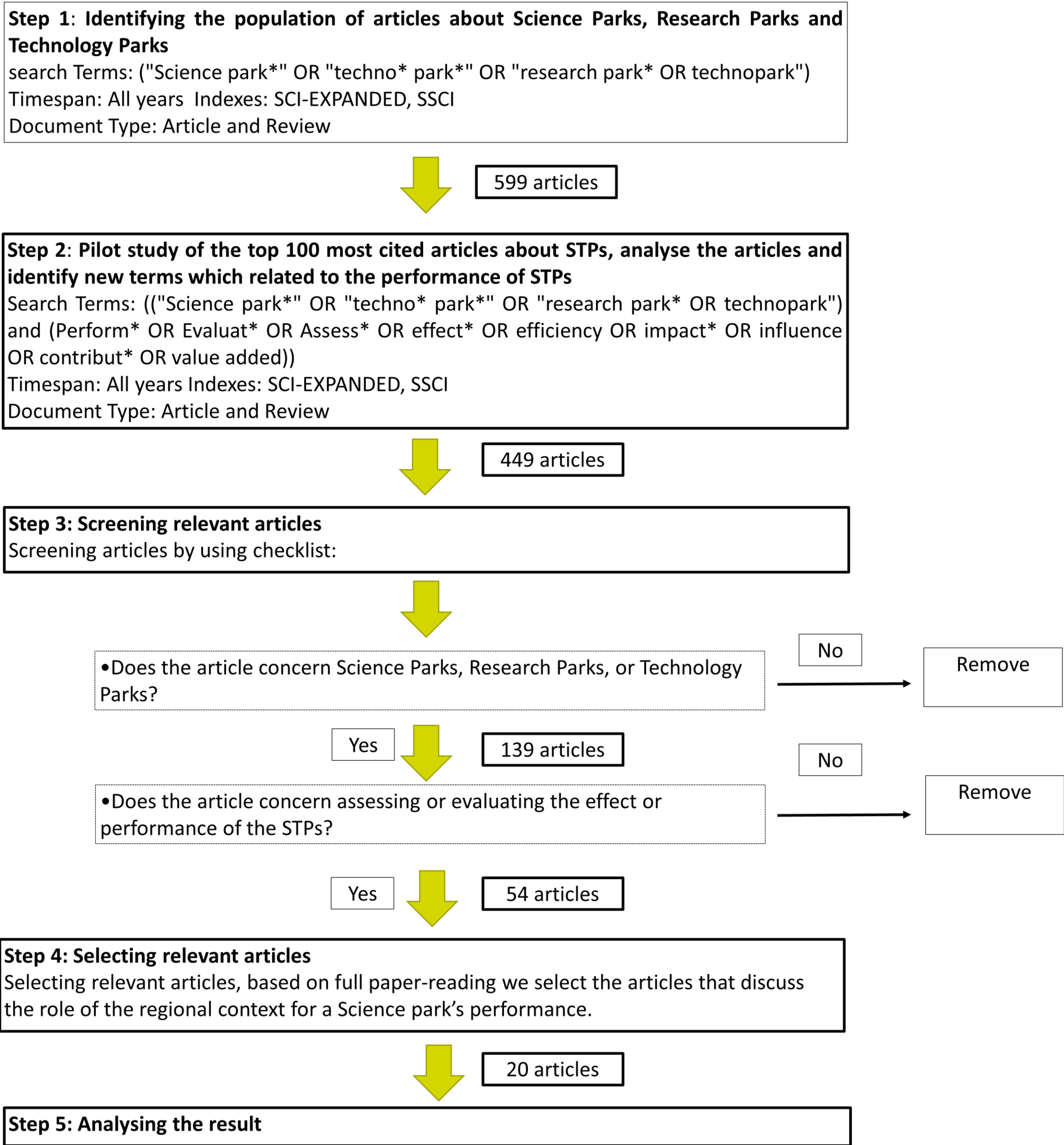
## Research Assumption

- “The performance of STPs relies on the regional context”

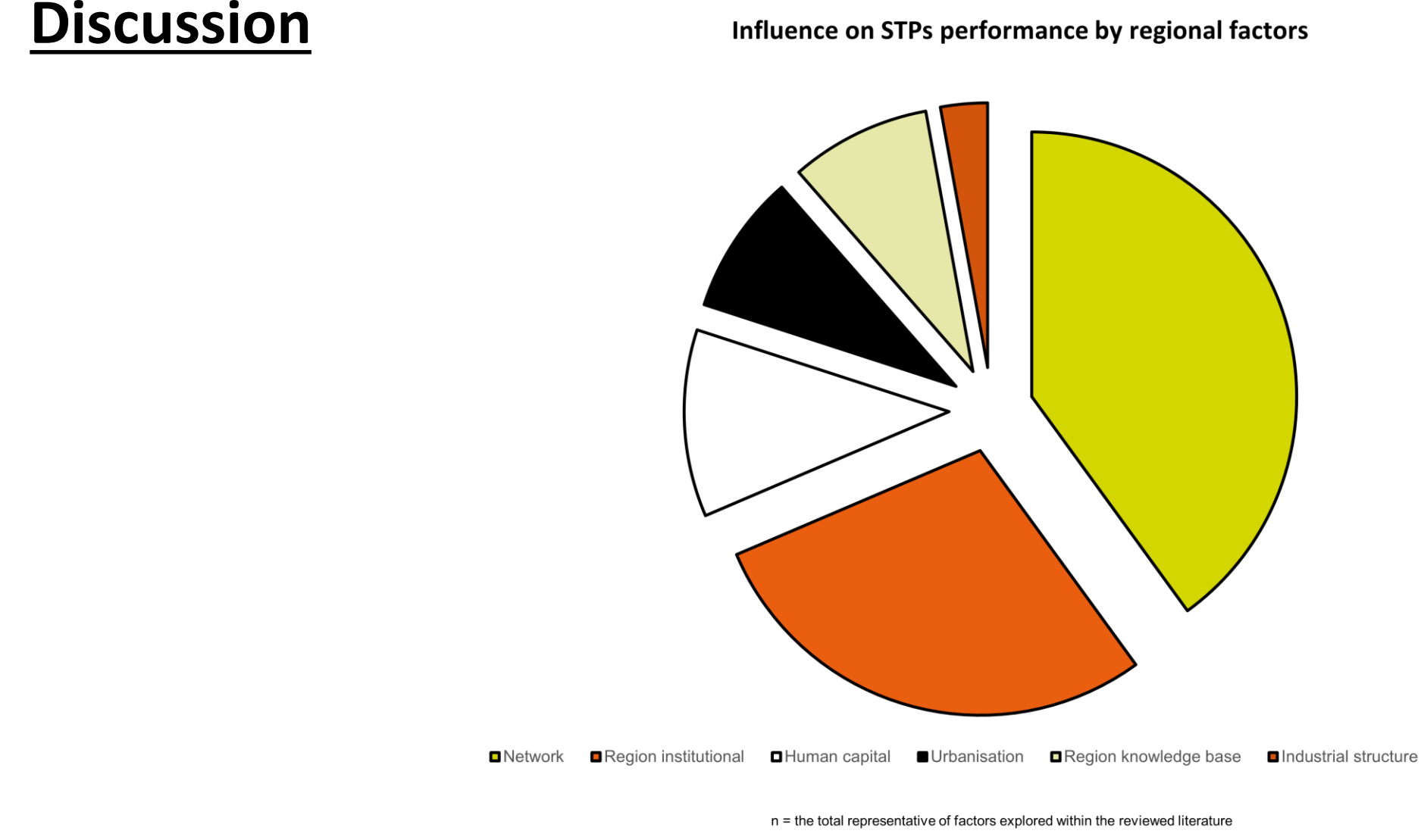
  - Regions offer an important source of competitive advantage (Starr & Saxenian, 1995).
  - Innovation creation in STPs has influenced by regional characteristic (Tsamis, 2009).
  - the successful STPs in the USA and China, which highlights that the innovation dynamic did not induce from the park itself but the interaction between University-Industry –Government in region (Etzkowitz, H., and Zhou, C. 2018) .

## Research Methodology

We conduct an exploratory literature review to examine how the regional context influence the performance of STPs



## Discussion



Based on the exploratory literature review, we categorise the regional factors that influence the performance of STPs into six groups; networks, institutional, urbanisation, human capital, regional knowledge base and industrial structure. Local network and regional institution are the most frequently mentioned. However, we could not summarise that these two factors have the highest impact on STPs performance. Apart from local networks and regional institutional, regional features as urbanisation, human capital, knowledge base in region and industrial structure are counted as the reflection of local inputs, which improve the innovation output (Gkypali, Kokkinos, Bouras, & Tsekouras, 2016). This study discuss the link of regional factors and the performance of STPs. We focus on the two highest mention factors due to the sufficient of the literature in these topics while the other remaining factors will need to be further unfold.

In relation to, how **local networks** influence to the positive of STPs's performance, the interaction between local actors can lead to knowledge spillovers, which create R&D interaction to promoting regional innovation (Jongwanich, Kohpaiboon, & Yang, 2014; Siegel, Westhead, & Wright, 2003). On the other hand, lack of networks argues the negative impact. Salvador (2011) shows the case of Turin spin-offs, that they are not well aware of the opportunities available for raising finance due to the lack of linkage among banks, foundations and incubators.

## Result

Study	Relevant regional factors that impact STPs's Performance					
	Network	Institutional	Human Capital	Urbanisation	Region Knowledge Base	Industrial Structure
Arauzo-Carod, J. M., Segarra-Blasco, A., & Teruel, M. (2018).	●			●		
Bigliardi, B., Dormio, A. I., Nosella, A., & Petroni, G. (2006).		●			●	
Colombo, M. G., & Delmastro, M. (2002).	●		●			
Gkypali, A., Kokkinos, V., Bouras, C., & Tsekouras, K. (2016).		●		●		
Hu, A. G. (2007).	●				●	
Hu, T. S. (2008).	●	●	●		●	●
Jongwanich, J., Kohpaiboon, A., & Yang, C. H. (2014).	●		●			
Kim, H.-Y., & Jung, C. M. (2010).		●				
Lindelöf, P., & Löfsten, H. (2003).		●				
Lofsten, H., & Lindelof, P. (2001).	●	●				
Lofsten, H., & Lindelöf, P. (2002).	●	●				
Minguillo, D., Tijssen, R., & Thelwall, M. (2015).	●					
Phillimore, J. (1999).	●					
Salvador, E. (2011).	●					
Shearmur, R., & Doloreux, D. (2000).	●					
Siegel, D. S., Westhead, P., & Wright, M. (2003).	●					
Watkins-Mathys, L., & Foster, M. J. (2006).	●	●				
Westhead, P. (1997).		●				
Yang, C. H., Motohashi, K., & Chen, J. R. (2009).				●		
Zeng, S., Xie, X., & Tam, C. (2010).	●	●	●			

There is a growing consensus that **regional institutions** play a significant role in promoting regional, economic development within the national and global context (Keune, 2001). The review shows that the involvement of local authorities influences the performance of STPs. For example, in the Swedish cases (Lindelöf & Löfsten, 2002, 2003; Lofsten & Lindelof, 2001; Löfsten & Lindelöf, 2003) local authorities are the main actor when new STPs are established. They also play a key role in encouraging universities to take a more active role in the revival of local economies and help to fulfil the parks’ intention to promote regional economic growth (Kim & Jung, 2010). Moreover, another institutional factor, namely the innovation and entrepreneurial culture are one of the key factors leading successful STPs to establish a favourable culture for regional sustainable innovation. Lack of a regional innovation culture illustrates the negative performance of STPs (Zeng, Xie, & Tam, 2010).

The review shows how the **remaining of these four factors (human capital, urbanisation, regional knowledge base and industrial structure)** influence the performance of STPs. For example, the successful case study from Taiwan, Hsinchu science park shows that their accomplishment heavily relies on the intellectually productive environment surrounding the park; the abundance of high-tech R&D resources, plentiful supply of technology, availability of human resources required by high- tech firms from related research institutes in this area, and the maturity of the community of interacting technological specialists. These factors have increased the efficiency of firms located on parks and attract the advanced foreign technologies and human resources (Hu, 2008; Yang, Motohashi, & Chen, 2009). This study is in line with the successful case of STPs from China (Hu, 2008; Jongwanich et al., 2014) and Italy which mention that the positive STPs’ performance has a possibility to attract a high quality of human capital (Colombo & Delmastro, 2002).

Shearmur & Doloreux (2000) show that STPs alone have no positive effect on regions’ industrial structure. Therefore the doubt about the performance of STPs will always remain. However, besides the characteristics of enterprises that locate in the parks other regional park input tend to highly influence the outcome (Goldstein & Luger, 1990).

## Future Work

- Create a framework from the literature
- Validate the framework with empirical studies, using interview and survey.
- Apply foresight as a tool for policy implication to improve STPs performance

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